

# ***Leptidea sinapis* and *Leptidea reali* (Lepidoptera: Pieridae): at what point does the first one of the two end, and the other one begin?**

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**Summary.** The existence of clinal variation in the male genitalia of the *Leptidea sinapis* / *L. reali* – complex is illustrated and discussed, suggesting that the presently accepted specific status for these two taxa is not as clear cut as it has been generally considered. It is hoped that the problem may eventually be solved through breeding, since this way it will be demonstrated whether or not genitalic variability is also to be met with in individuals derived from the same parents.

**Samenvatting.** *Leptidea sinapis* en *Leptidea reali* (Lepidoptera: Pieridae): waar precies eindigt de eerste van de twee, en waar begint die ander?

De clinale variatie in de mannelijke genitalia van het complex *Leptidea sinapis* / *L. reali* wordt geïllustreerd en besproken. De huidige, algemeen aanvaarde soortstatus van beide taxa is niet zo duidelijk als algemeen aangenomen. Het is te hopen tan het probleem uiteindelijk zal kunnen worden opgelost door kweken, waardoor kan aangetoond worden of deze variabiliteit in de genitalia ook voorkomt in individuen die afkomstig zijn van hetzelfde ouderpaar.

**Résumé.** *Leptidea sinapis* et *Leptidea reali* (Lepidoptera: Pieridae) : à quel point est-ce que le premier s'arrête-t-il, et où le second commence-t-il?

L'existence d'une variation clinale dans les genitalia mâles du complexe *Leptidea sinapis* / *L. reali* est illustrée et discutée, en suggérant que le statut spécifique des deux taxa n'est pas aussi clair qu'il est actuellement supposé. Le problème pourrait être résolu par des expériences de croisement, puisqu'avec cette méthode il serait possible de démontrer si cette variabilité est présente aussi chez des individus dérivés des mêmes parents.

**Key words:** Pieridae – *Leptidea sinapis* – *Leptidea reali* – Male genitalia – Clinal variation – Greece – Balkans.

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## **Introduction**

*Leptidea reali* Reissinger, 1989 was separated from the superficially totally similar *Leptidea sinapis* (Linnaeus, 1758) on the basis of differentiating characters both in the male as well as the female genitalia (Réal 1988, Reissinger 1989, Lorcović 1993). The male appendages of these two taxa were found to differ from each other by the length of the aedeagus and sacculus, both being longer in the former. The females were found to differ by the length of the antrum, which again is longer in the former. Syntopism added further support to their specific separation. In view of all this it became apparent that an investigation had to be carried out for the possible inclusion of *L. reali* amongst collection specimens originally determined as *L. sinapis*. The results of just such an investigation, carried out on a very large number of specimens in the author's collection – most of which are from Greece, while a few are from other parts of the Balkan Peninsula – suggest that differentiation between these two taxa based on their male genitalia is not an entirely clear cut affair.

## **The male genitalia drawings**

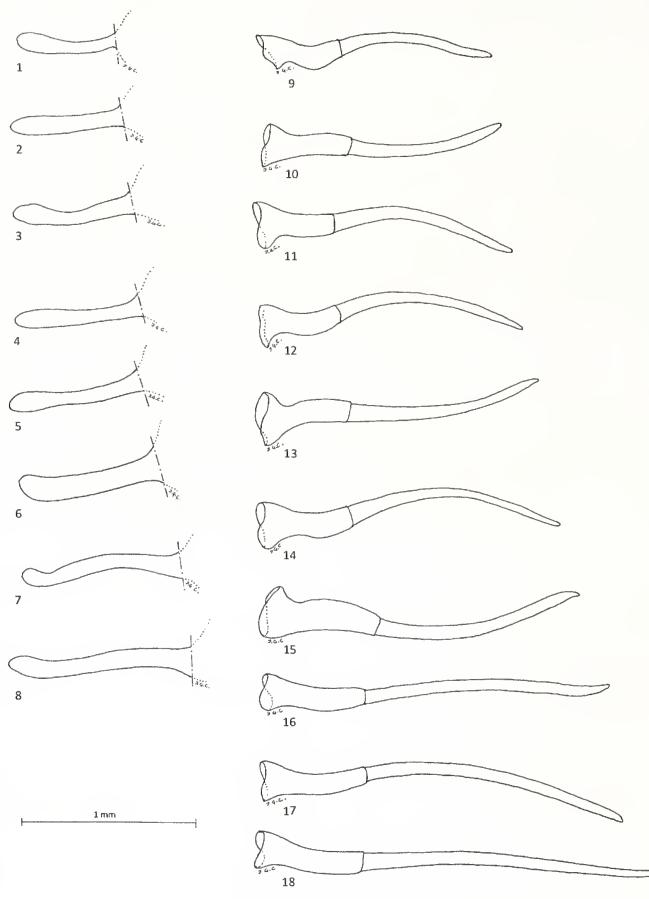
Due to the very large number of studied specimens, as well as the time consuming process of preparing and drawing the genitalia, it was decided to draw only the silhouettes of the appendages, thus attaining simplification without the loss of differentiating characters.

## **Clinal variation in the male genitalia of the *L. sinapis* / *reali* – complex**

A quick look at figs 1–18, showing in lateral aspect the right side of the saccus and aedeagus of specimens in the *L. sinapis* / *reali* – complex, makes it quite apparent that the difference in size of these genitalic components is clinal. If one takes into consideration only the size minima and maxima, one would have no problem in deciding what specimen is a *L. sinapis* and what a *L. reali*, but given the clinal nature of the variation it becomes evident that it is impossible to decide where exactly *L. sinapis* ends and *L. reali* begins and vice versa.

## **Conclusion**

From the evidence presented above it becomes apparent that the specific separation of *L. reali* from *L. sinapis*, though not to be rejected off hand, does, however, raise some questions. It may be that the two taxa are indeed two separate species that often interbreed and produce offspring with intermediate genitalic characters. It may also be that despite this hybridization the parent species persist as such in time. Another hypothesis would be that the observed genitalic differences are due to intraspecific variation, perhaps caused by larval host-plant choice, or due to genitalic character instability. Whatever the actual truth of the matter is, the problem can only be solved by rearing these butterflies, and it is sincerely hoped that this will indeed be done by someone in the for-seeable future.



Figs.1-18. Lateral aspect of right side of male genitalic components of butterflies in the *L. sinapis* / *L. reali* – complex. 1–8. Saccus. 9–18. Aedeagus. 1–15, 17, 18. Greece. 16. Croatia, Ozalj, 700 m, 2.vii.1983. 1. Crete, near Furnés, 150 m, 17.vi.1973. 2, 9. Ípiros, near Párga. 2. Pérdika, 100 m, 16.vii.1996. 9. Kastrossíki, 21.viii.1991. 3. S Pindos Mts., Kastaniá, 800 m, 21.iv.1968. 4. Skópelos Island, Potamí, 4.iv.1985. 5, 13. Attiki, Inóti, 400 m. 5, 13. v.1984. 13, 23.iv.1990. 6–8, 10, 11, 14, 15, 17, 18. Makedónia. 6–8, 15, 17, 18. Rodópí Mts., Vathírema, 11.vii.2011. 14. Florína district, Mt Varnús, 1400 m, 21.vi.1996. 10. Vérmion Mt., Tria me Pénde Pigádi, 1600 m, 14.viii.1991. 11. Mt. Falakró, 1300 m, 4.vi.1988. 12. Steréa Ellás, Mt. Ití, Kastaniá, 3.vii.1987.

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